CLAIMS

I claim:

1. A radial/rotary propulsion system, comprising:

a) a single flywheel comprising non magnetic material, having an axis of rotation, a first face and an opposing second face;

b) a first group of permanent magnets, comprising an even number of permanent magnets of uniform polarity mounted on at least one of said first and said opposing faces in a first circular array disposed concentrically around said axis of rotation at a predetermined first radius;

c) a second group of permanent magnets, comprising an even number of permanent magnets of uniform polarity mounted on at least one of said first and said opposing faces in a second circular array disposed concentrically around

said axis of rotation at a predetermined second radius of magnitude less than that of said first radius;

d) a first group of electromagnets disposed proximate said flywheel to selectively repel at least one of said first group of permanent magnets;

e) a second group of electromagnets disposed proximate said flywheel to selectively repel at least one of said second group of permanent magnets;

f) a controller/sequencer adapted to selectively apply DC power to said electromagnets of said first group of electromagnets and said second group of electromagnets to induce rotation of said flywheel selectively at variable torques and speeds in at least a first direction of rotation.

2. The radial/rotary propulsion system as recited in claim 1, wherein said selective application of DC power comprises selectively applying a DC pulse to at least one electromagnet of at least one of said first group and said second group of electromagnets.

3. The radial/rotary propulsion system as recited in claim 2, wherein said controller/sequencer comprises means for generating short duration, high energy DC pulses and said selectively applied DC pulse comprises a short duration, high energy DC pulses therefrom.

4. The radial/rotary propulsion system as recited in claim 3, wherein said means for generating short duration, high energy DC pulses comprises a capacitive discharge power supply.

5. The radial/rotary propulsion system as recited in claim 2, further comprising a bearing coupling said flywheel to said axle and wherein said DC pulses are selectively applied substantially simultaneously to pairs of said electromagnets from at least one of said first group and said second group of electromagnets, electromagnets in said pairs being substantially diametrically opposed to one another, so as to minimize stress on said bearing.

6. The radial/rotary propulsion system as recited in claim 5, wherein said bearing is a one-way bearing.

7. The radial/rotary propulsion system as recited in claim 1, further comprising:

g) a third group of permanent magnets, comprising an even number of permanent magnets mounted on at least one of said first and said opposing faces in a third circular array disposed a predetermined third radius; and

h) a group of alternator coils disposed in proximity to said flywheel to interact with said permanent magnets of said third group of permanent magnets.

8. The radial/rotary propulsion system as recited in claim 7, wherein said controller/sequencer further comprises means for disconnecting power to said electromagnets of said first group and said second group of electromagnets, thereby establishing a coast mode of operation of said radial/rotary propulsion system.

9. The radial/rotary propulsion system as recited in claim 8, wherein said coast mode of operation comprises at least one of a dynamic braking mode and a regenerative mode of operation.

10. The radial/rotary propulsion system as recited in claim 9, wherein said controller/sequencer comprises means to recharge a battery from energy recaptured by said alternator coils during said regenerative mode of operation.

11. The radial/rotary propulsion system as recited in claim 1, wherein at least one magnet of at least one of said first magnet group and said second magnet group of permanent magnets, comprise at least one magnet imbedded in said flywheel.

12. The radial/rotary propulsion system as recited in claim 11, wherein said at least one magnet imbedded in said flywheel comprise a magnet projecting completely through said flywheel with a first magnetic pole at a first opposing face and an opposite magnetic pole as a second opposing face of said flywheel.

13. The radial/rotary propulsion system as recited in claim 1, further comprising regeneration means for converting inertial energy of said flywheel into electrical energy during a coast mode of operation.

14. The radial/rotary propulsion system as recited in claim 13, wherein said regeneration means comprises said electromagnet means interacting with at least one of said first group of permanent magnets and said second group of permanent magnets during said coast mode of operation.

15. A radial/rotary propulsion system, comprising:

a flywheel rotatably affixed to an axle, said flywheel having a pair of opposing faces;

a plurality of permanent magnets fixedly attached to at least one of said pair of opposing faces, said plurality of permanent magnets being arranged in at least two substantially concentric circles, a first group of permanent magnets in a first permanent magnet group in a first concentric circle and a second group of permanent magnets in a second permanent magnet group in a second concentric circle, each of said first and said second substantially concentric circles also being essentially concentric with said axle; and

a plurality of electromagnets, disposed adjacent to said flywheel and adapted to selectively interact with at least one of said first permanent magnet group and said second permanent magnet group in a manner which repels said permanent magnets in at least one of said first permanent magnet group and said second permanent magnet group, thereby imparting rotary motion to said flywheel relative to said axle during a drive mode of operation.

16. An electrically powered land vehicle, comprising: a wheel equipped with a radial/rotary propulsion system comprising a flywheel rotatably affixed to an axle, said flywheel having a pair of opposing faces; a plurality of permanent magnets fixedly attached to at least one of said pair of opposing faces, said plurality of magnets being arranged in at least two substantially concentric circles, a first group of permanent magnets in a first permanent magnet group in a first concentric circle and a second group of permanent magnets in a second permanent magnet group in a second concentric circle, each of said first and said second substantially concentric circles also being essentially concentric with said axle; electromagnet means, adjacent said flywheel, adapted to selectively interact with at least one of said first permanent magnet group and said second permanent magnet group in a manner repels magnets in said at least one of said first permanent magnet group and said second permanent magnet group, thereby imparting rotary motion to said flywheel relative to said axle, thereby defining a drive mode of operation during which time said vehicle is propelled in a predetermined direction.

17. The electrically powered land vehicle as recited in claim 16, further comprising controller/sequencer means operatively connected to said radial/rotary propulsion system, for determining said predetermined direction of travel and for controlling at least the speed of said vehicle.

18. The electrically powered land vehicle as recited in claim 17, wherein said controller/sequencer further comprises braking control means whereby said vehicle is slowed by recapture of inertial energy from said flywheel.

19. The electrically powered land vehicle as recited in claim 18, further comprising at least two wheels, each wheel equipped with a radial/rotary propulsion system; and steering means operatively connected to said controller/sequencer whereby the direction of travel of said vehicle is at least partially determined by selective control of each of said two radial/rotary propulsion systems under the control of said controller/sequencer.